

REMARKS

I. Status of the Claims and Formal Matters

Applicants respectfully request reconsideration and allowance of the claims, as amended, in light of the remarks made herein. Examiner Barrett is thanked for his time and helpful comments during a recent telephone conversation.

Claims 1-22 are pending in this application, of which claims 21 and 22 are withdrawn from consideration. Claims 1, 3, 12, 15 and 17 are amended by this response. New claim 23 is added. Support for each amendment is found in the specification. The amendments have been made simply to address formal matters and to place the claims in condition for allowance. No new matter has been added.

It is submitted that the claims, herewith and as originally presented, are patentably distinct over the documents cited by the Examiner, and that these claims were in full compliance with the requirements of 35 U.S.C. §112. The amendments of and additions to the claims, as presented herein, are not made for purposes of patentability within the meaning of 35 U.S.C. §§§§ 101, 102, 103 or 112. Rather, these amendments and additions are made simply for clarification and to round out the scope of protection to which Applicants are entitled. Furthermore, it is explicitly stated that the herewith amendments should not give rise to any estoppel, as the herewith amendments are not narrowing amendments.

II. The Rejections Under 35 U.S.C. § 112 (first paragraph) are overcome

The Office Action asserts that the limitation “or polymer” in claims 1, 12, and 17 is not described in the specification but highlights the fact that the specification does describe the absence of a “cross-linkable substrate.” Claims 1, 12 and 17 are amended to delete “polymer” and instead recite “cross-linkable substrate.” A description of a “cross-linkable substrate” in the context of the present invention is found on page 2 of the application at lines 7-12.

The Office Action also asserts that the limitation “toluidine blue” in claim 3 is not supported by the specification. This rejection is respectfully traversed. The specification supports the use of thiazine dyes (see page 9 line 7 of the specification). It is well known by those of skill in the art that toluidine blue is a thiazine dye. This can be demonstrated by published articles in the field that reflect the knowledge of those skilled in the art. For example, Dunipace et al. (1992) Mutation Research 279, p 255-259 (a copy of which is enclosed herein)

teaches that “toluidine blue is a vital metachromatic thiazine dye”. Furthermore, one of skill in the art would know that toluidine blue has an excitation wavelength of greater than about 488 nm, as the Merck Index, 12th edition., Budavari, S. et al., Eds.; Rahway, NJ; 1996; Monograph 9658 (copy of which is enclosed herein) teaches that the absorption maximum for toluidine blue in water is 640 nm. One of skill in the art would readily understand that toluidine blue is among the thiazine dyes that can be used in conjunction with the claimed methods of the present invention. However, to expedite prosecution in favor of allowance, claim 3 has been amended and claim 23 has been added. As supported by the specification, new claim 23 recites the use of a thiazine dye.

The Office Action makes a further rejection under 35 U.S.C. 112 first paragraph, asserting that the use of electromagnetic radiation having an energy level of “less than” 200 J/cm² is not supported by the specification. This rejection is respectfully traversed. Example 1 of the specification (page 16 line 12) describes radiation energies in the range of 124 to 1524 J/cm². Applicants hereby by amend claim 15 to recite the range of radiation energies from about 124 to about 762 J/cm². In Example 3, ranges up to 762 J/cm² are described as preferred embodiments. No new matter is added by this amendment, which is made solely to round out the scope of protection to which the Applicant is entitled. In addition to the support for these radiation energy ranges provided in Example 1 and 3, the specification additionally teaches preferred ranges of electromagnetic radiation energy, including ranges from 200 J/cm² to 800 J/cm² in the final paragraph of page 4.

III. The Rejections Under 35 U.S.C. § 102(b) are overcome

The Office Action asserts that claims 1-2, 6-8 and 12-14 of the present application are anticipated by Saunders (1998) and Judy et al., (1993). Applicants respectfully traverse this rejection.

Saunders states that blue laser light (e.g., 420 nm) may be used to activate yellow naphthalimide dyes for use in “tissue welding.” Blue wavelength light is typically considered to be light having wavelengths ranging from around 400 to around 480 nm. Similarly, Judy et al. (1993) teaches that light having a wavelength of around 420 nm may be used to activate naphthalimide dyes for use in tissue welding.

Claims 1 and 12 have been amended to recite wavelengths of greater than about 488 nm, thereby rendering the rejections over Saunders (1998) and Judy et al. (1993), moot. Support for the use of such wavelengths is found in Example 1 (page 15 line 26 to page 16 line 3):

“The photosensitizers, their absorption maxima, and their absorption coefficients at the laser wavelength used in this Example were, e.g., rose bengal (RB), 550 nm, $33000 \text{ dm}^3 \text{ mol}^{-1} \text{ cm}^{-1}$ at 514 nm; fluorescein (FI), 490 nm, $88300 \text{ dm}^3 \text{ mol}^{-1} \text{ cm}^{-1}$ at 488 nm; methylene blue (MB), 664 nm, $15600 \text{ dm}^3 \text{ mol}^{-1} \text{ cm}^{-1}$ at 661 nm; riboflavin-5-phosphate (R-5-P), 445 nm, $4330 \text{ dm}^3 \text{ mol}^{-1} \text{ cm}^{-1}$ at 488 nm;”

Use of a longer wavelength (i.e., greater than about 488 nm) in the claimed methods results in better penetration, which in turn produces longitudinal bonding within a target tissue. Tissues bonded according to the claimed methods have greater strength after bonding and are not subject to thermal damage. Judy and Saunders do not teach or suggest this method.

Judy and Saunders describe use of a 1,8 naphthalimide dye at a wavelength of about 420 nm. Application of a wavelength greater than about 488 nm to the naphthalimide dye would not result in tissue bonding. Judy and Saunders do not teach the claimed methods, and fail to provide any suggestion or motivation to achieve their superior result.

REQUEST FOR INTERVIEW

If any issue remains as an impediment to allowance, a further interview with the Examiner and SPE are respectfully requested; and, the Examiner is additionally requested to contact the undersigned to arrange a mutually convenient time and manner for such an interview.

CONCLUSION

Applicants believe that the application is in condition for allowance, and favorable reconsideration of the application and prompt issuance of a Notice of Allowance are earnestly solicited. Entry of this paper is respectfully requested.

Respectfully submitted,

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